

STUDIES IN THE GENERA OF THE *DIOSMEAE* (RUTACEAE): 5

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ABSTRACT

Two new species of *Euchaetis*, one from the vicinity of Albertinia and the other from the vicinity of Riversdale, three new species of *Diosma*, one from the mountains near Riversonderend, one from the Baviaanskloof and one from near Mossel Bay, and one new species of *Macrostylis* from the plains near Elim are described.

UITTREKSEL

STUDIES IN DIE GENERA VAN DIE *DIOSMEAE* (RUTACEAE): 5

Twee nuwe *Euchaetis* soorte, drie nuwe *Diosma* soorte, en een nuwe *Macrostylis* soort word beskryf.

Euchaetis albertiniana Williams sp.nov. propria propter folia appressa lanceolata, sepala ciliata, antheras glandulis 0,3 mm longis acutis coronatas.

Frutex 30-50 cm, erectus, diffusus, gracilis, ad basim monocaulis. *Rami* recti, graciles, dichotomi, glabrescentes. *Ramuli* brevi, graciles, puberuli. *Folia* 3-5 mm longa, 1,2-1,7 mm lata, elliptica vel lanceolata, acuta, minute callosa, sub-trigona, serrulata, glabra, glanduloso-punctata, sessilia, appressa, decussata. *Inflorescentia* terminalis, bini. *Flos* 5 mm diam., albus vel sub-roseus. *Bractea* 1,5-2 mm longa, 1-1,1 mm lata, elliptica, minute callosa, ciliolata, glabra, glanduloso-punctata, sessilis. *Bracteolae* duae, 1,5-1,7 mm longae, 0,7-1 mm latae, apicibus incrassantis, marginibus hyalaneis ciliolatis, in medio glanduloso-punctata. *Sepala* quinque, 1,7-1,8 mm longa, 1,7-2,1 mm lata, irregularia, apicibus incrassatis viridis, marginibus hyalinis latis ciliatis. *Petala* quinque, 3,5-4 mm longa, 2-2,6 mm lata, transverse barbata, ad basim ciliata. *Staminodia* quinque, 0,05-0,1 mm diam., vestigialia. *Fila* quinque, 1,5-1,9 mm longa, glabra. *Antherae* quinque, ante anthesin 0,8-1,2 mm longae, 0,6-0,7 mm latae, aurantiacae vel vinosae, glandula 3 mm longa coronata. *Pollen* 45-50 μ longum, 28 μ diam., ellipsoideum. *Discus* viridus, succulentus, ovarium excedens, nectarifer. *Stigma* 0,4-0,5 mm diam., globosum, capitatum, viridum. *Stylus* 1 mm longus, erectus, glaber, persistens. *Ovarium* 5-carpellatum, 0,8 mm longum, 0,7 mm diam., ad apice minute pilosum. *Fructus* 5-carpellatus, 4,5 mm longus,

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levis, glanduloso-punctatus. *Cornua* perbrevia, patentia, apicibus bifidis, minute pilosis, glanduliferis. *Semen* 3 mm longum, 1,3 mm latum, piceum, nitens.

Type: CAPE—3421 (Riversdale): Near Askop on south side of road 16 km west of Albertinia (-AB), 180 m alt., 2/3/1974 *Williams* 1879 (NBG, holotype; K, PRE, STE, isotypes).

It would appear that this plant was first collected by Dr. J. Muir in 1913 near Albertinia. He mentions it on page 35 in his paper on "The Vegetation of the Riversdale Area", published in 1929, under the name *Euchaetis burchellii*. This is a closely related species differing however in several important respects from the plant here described for the first time.

Shrubs 30–50 cm tall, erect, diffuse, slender, single stemmed towards the base. *Branches* erect, slender, dichotomous, glabrescent. *Branchlets* short, slender, pubescent with very short erect white hairs. *Leaves* 3–5 mm long, 1,2–1,7 mm broad, elliptic or lanceolate, acute, apex minutely callused, hyaline margins very narrow and ciliate with short stout hairs fairly widely spaced, sub-triangular in cross section, channelled on the inside when dry, gland dotted along either side of the midrib and with smaller glands along the margins, glabrous, sessile, adpressed, erect, decussate. *Inflorescence* terminal, with the flowers normally in pairs, white or pinkish, 5 mm diam. *Bract* one to each flower, 1,5–2 mm long, 1–1,1 mm broad, elliptic, obtuse with a minute apical callus, margins ciliolate, glabrous, gland dotted, sessile. *Bracteoles* two, 1,5–1,7 mm long, 0,7–1 mm broad, irregular in outline with a thick green apex, midrib gland dotted, hyaline margins broad, ciliolate, adaxial surface with a few very short bristly hairs. *Calyx lobes* five, 1,7–1,8 mm long, 1,7–2,1 mm broad, irregular in outline, with a thick green apex and broad ciliate hyaline margins, adaxial surface pubescent. *Petals* five, 3,5–4 mm long. *Limb* 2–2,6 mm broad, orbicular, retuse, glabrous, with a few gland dots. *Claw* 2 mm long, narrowing to the base, transversely bearded above with a few hairs down the midrib, ciliate. *Staminodes* five, 0,05–0,1 mm diam., vestigial. *Filaments* five, 1,5–1,9 mm long, glabrous. *Anthers* five, 0,8–1,2 mm long, 0,6–0,7 mm broad, orange or wine coloured, with an apical gland 3 mm long. *Pollen* 45–50 μ long, 28 μ diam., ellipsoid. *Disc* exceeds the ovary, green, fleshy, exudes nectar. *Stigma* 0,4–0,5 mm diam., globose, capitate, green, persisting. *Style* 1 mm long, erect, glabrous, persisting. *Ovary* 5-carpellate, 0,8 mm long, 0,7 mm diam., each carpel with a globose gland at the apex surrounded by a few very short hairs. *Fruit* 5-carpellate; *carpels* 4,5 mm long, smooth, gland dotted, reddened on the outside; *horns* about 1 mm long, spreading at 45°, apices bristly, bifid with a gland. *Seed* 3 mm long, 1,3 mm broad, black, shining.

SPECIMENS EXAMINED

CAPE—3421 (Riversdale): near Askop on south side of road 16 km west of Albertinia, (-AB), 180 m alt., 2/3/1974 *Williams* 1897 (NBG, K, PRE, STE);

10 miles west of Albertinia (-AB), 4/4/1952 *Lewis 4139* (SAM), 4/4/1952 *Compton 23324* (NBG); Sandy flats 6 miles west of Albertinia (-AB), 13/4/1962 *Lewis 5921* (NBG); National Road near Albertinia in sand (-BA), 7/12/1951 *Esterhuysen 19515* (BOL, K, NBG); Albertinia (-BA), 10/11/1952 *Middlemost 1829* (BOL, NBG, SAM), 17/12/1949 *Martin 6* (NBG) Roggeland near Albertinia (-BA), 5/5/1913 *Muir 843* (PRE, SAM); less than 1 km NNW of Albertinia (-BA), 600 ft., 6/7/1973 *Williams 1821* (BOL, C, GRA, NBG, K, M, MO, PRE, S, STE); sandy hills between Albertinia and Ystervarkfontein (-BA), 1 000 ft., 9/3/1966 *Rourke 353* (NBG, STE); Asvogelberg hills between Albertinia and Melkhoutfontein (-BA), 10/6/1966 *Rourke 461* (NBG); 10 miles south of Albertinia (-BC), 600 ft., 30/7/1962 *Acocks 22551* (STE); Ystervarkfontein, sandveld near sea (-BC), 200 ft., *Bayliss BRI 181* (GRA, NBG).

DISTRIBUTION AND BIOLOGY

Euchaetis albertiniana is found in a fairly small area beginning in the vicinity of the town of Albertinia and extending a few miles westwards. It grows on deep sandy soil at altitudes of 60 to 300 m (200 to 1 000 feet) above sea level. The flowering season has not been closely studied due to the small number of collections made, but it would appear to extend at least from November until July. Ripe fruits have been gathered in March and April. Pollination is most probably by insects and the ripe seeds are ejected by the usual catapult mechanism. Regeneration from seed takes place after fires. The leaves have a faint smell of turpentine or eucalyptus when crushed.

DISCUSSION

This plant appears in most respects to be a typical *Euchaetis*. (1) The *flowers* are in pairs. (2) The *petals* are transversely bearded. (3) *Staminodes* are vestigial. (4) The *anther* possesses a small apical gland which is rather larger than normal. (5) The *disc* is well developed and exceeds the ovary. (6) The *stigma* is capitate. (7) The *style* is short. (8) The *filaments* and *style* are glabrous. (9) The *ovary* is 5-carpellate.

Euchaetis albertiniana is recognised as distinct from *E. burchellii* in that it is destroyed by fires whereas *E. burchellii* develops a stout rootstock from which it may regenerate after fires. Unfortunately this valuable character is seldom noted on a herbarium sheet. Among other characteristic differences one may, however, see that the leaves in *E. albertiniana* are often adpressed, ciliate with an apical callus, whereas those of *E. burchellii* are never so. The anther in *E. albertiniana* possesses a small pointed gland, but that of *E. burchellii* is minute. *E. albertiniana* is also closely related to *Euchaetis laevigata* Turcz. but differs in that the leaves of *E. laevigata* are complicate, orbicular, spreading and somewhat more recurved towards the apex. The apical gland on the anther in

E. laevigata is minute as in *E. burchellii* but not in *E. albertiniana*. *E. burchellii* is found in sandy soil fairly near the coast from near Great Brak River in the east to Uilenkraal River near Gans Baai in the west. *E. laevigata* occurs on limestone hills near Bredasdorp. The name refers to the locality where this species occurs.

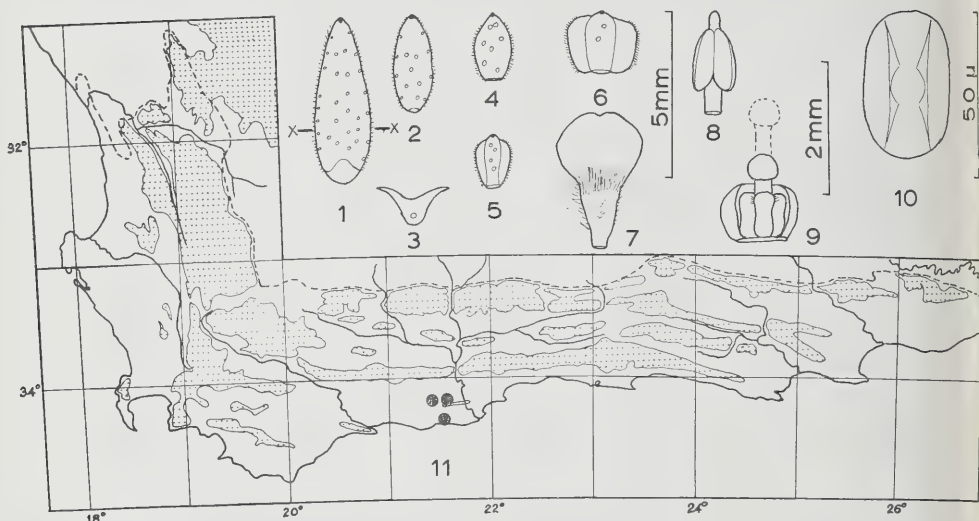


FIG. 1.

Euchaetis albertiniana: 1. Leaf; 2. Leaf; 3. Section of Leaf; 4. Bract; 5. Bracteole; 6. Calyx lobe; 7. Petal; 8. Anther; 9. Gynoecium; 10. Pollen; 11. Distribution.

***Euchaetis longicornis* Williams, sp.nov.** propria propter folia erecta, bracteas et bracteolas subulatas, sepala acuminata, fructum cornua longa ferentem.

Frutex 30–100 cm, erectiuscula, ad basim monocaulis. *Rami* brevi, asperi, glabrescenti. *Ramuli* erecti, brevi, graciliusculi, foliosi, puberuli. *Folia* 13–15 mm longa, 1 mm lata, sub-teretia, subulata, eciliata, glandulosa-punctata, scabrida, breve petiolata, crebra, erecta, dispersa. *Inflorescentia* terminalis, aggregata. *Flos* 3 mm diam. *Pedicellus* 2 mm longus, puberulus, in medio bracteolatus. *Bractea* extima 6,5–7 mm lata, subulata, sparsim puberula, glanduloso-punctata, minute ciliolata; intima bracteolae similis. *Bracteolae* duae, 4 mm longae, similis bractearum. *Sepala* quinque, 4–4,5 mm longa, ad basim 1,7 mm lata, acuminata, sparsim puberula, ciliolata. *Petala* quinque, 3,5–4 mm longa, 1–1,2 mm lata, oblonga, sub-acuta, transverse-barbata, ad basim ciliata, serrulata. *Staminodia* quinque, vestigialia, 0,2 mm diam. *Fila* quinque, post anthesim

1,2 mm longa. *Antherae* quinque, ante anthesim 1,1 mm longae, 0,76 mm latae, vinosae, apicibus minute glandulosi. *Pollen* 37–45 μ longum, 23–22 μ diam., oblongum. *Discus* 5-sinuato-crenulatus, viridus, apertus, nectarifer, ovarium excedens. *Stigma* 0,2 mm diam., capitellatum, globosum, viridum. *Stylus* 1,6 mm longus, erectus, glaber. *Ovarium* 5-carpellatum, 0,5 mm longum, 0,7 mm diam. *Fructus* 5-carpellatus, 13 mm longus, glaber, glanduloso-punctatus, striatus, cornibus 7 mm longis, erectis, gracilibus. *Semen* 5–6 mm longum, piceum, nitens.

Type: CAPE—3421 (Riversdale): On the north slopes of Plaattjieskop between the Kaffirkuils and Soetmelks rivers (-AB), 240 m alt., 3/5/1974 *Williams* 1896 (NBG, holotype; K, MO, M, PRE, S, STE, isotypes).

On the 20th of November 1814 William Burchell collected this plant "near our station at Zoetmelks River along the road west 1 mile". He wrote the manuscript name *Diosma quinquecornu* and a short description on his collecting ticket. Using this information, one hundred and sixty years later, the author was very easily able to rediscover this unique plant in exactly the same locality.

Shrubs 30–100 cm tall, fairly erect, spreading up to 1,20 m wide, not dense, arising from a single stem at ground level. *Bark* dark brown, smooth with small leaf scars on the lower branches. *Branches* short, glabrescent, knotty with raised leaf scars. *Branchlets* short, fairly slender, leafy, clothed with a short dense white pubescence. *Leaves* 13–15 mm long, 1 mm broad, sub-terete, subulate, eciliate, gland-dotted, scabrid, with a short reddish petiole, crowded, sub-imbriate, fairly erect, somewhat falcate when dry, scattered. *Inflorescence* a much reduced compound raceme with *flowers* 1–3-nate, 3 mm diam., star shaped, white, opening in succession, more or less surrounded by the uppermost leaves. *Pedicel* 2 mm long, puberulous, with a pair of bracteoles about the middle. *Bract* 6,5–7 mm long, 0,7 mm broad, subulate, sparsely puberulous, gland-dotted, minutely ciliate; the innermost 4 mm long. *Bracteoles* two, 4 mm long, otherwise similar to the bracts. *Calyx lobes* five, 4–4,5 mm long, 1,7 mm broad below, acuminate, sparsely puberulous, ciliate. *Petals* five, 3,5–4 mm long, 1–1,2 mm broad, oblong, sub-acute, margins of limb somewhat serrulate. *Claw* transversely bearded, ciliate. The beard and cilia enclose the reproductive parts of the flower in a delicate cage. *Staminodes* five, 0,2 mm diam., vestigial, a sessile spherical gland at the apex of each lobe of the disc. *Filaments* five, becoming 1,2 mm long after anthesis, bearing a very few minute hairs. *Anthers* five, before anthesis 1,1 mm long, 0,75 mm broad, wine coloured, with a minute apical gland. *Pollen* 37–45 μ long, 23–22 μ diam., oblong. *Disc* 10-sinuate, green, stands open, exceeds the ovary, exudes nectar. *Stigma* 0,2 mm diam., capitellate, globose, green. *Style* 1,6 mm long, erect, glabrous, the lower half not shrinking so much when withered. *Ovary* 5-carpellate, 0,5 mm long, 0,7 mm diam., with one or at most two small hairs on each lobe. *Fruit* 5-carpellate, 13 mm long,

glabrous, gland-dotted, striate veined with *horns* 7 mm long, erect, slender. *Seed* 5–6 mm long, black, shining.

SPECIMENS EXAMINED

CAPE—3421 (Riversdale): Near our station at Zoetmelks River along the road west 1 mile (-AB), 20/11/1814 *Burchell* 6740 (K, P); on the north slopes of Plaatjieskop between the Kaffirkuils and Soetmelks Rivers (-AB), 240 m alt. 3/5/1974 *Williams* 1896 (NBG, K, M, MO, PRE, S, STE) Riversdale Nature Reserve, near trig. beacon (-AB), 800', 3/6/1970 *Taylor* 7734 (STE).

DISTRIBUTION AND BIOLOGY

Many hilltops on the plain between Bredasdorp and Albertinia are capped with a horizontal layer of silcrete which has slowed down the rate of erosion and provided on the slopes below small "islands" of soil differing from the surrounding cultivated lands. *Euchaetis longicornis*, although quite accessible, has so seldom been collected that one expects it to be endemic to a very small area and even possibly a relic with a previously much more extensive distribution. It is unusual in that it is the only species of *Euchaetis* with really sharp pointed leaves, quite unpleasant to touch, it bears fruits with by far the longest horns in the genus and its flowers give off a strong foetid smell. This smell is a character which I have, as yet, not noted in any other plant in the *Diosmeae*. The leaves of all the *Diosmeae* release odours of more or less pungency from their oil glands when crushed. However the foetid odour given off not by the oil glands but by the tiny flowers of *E. longicornis* can permeate a whole room. Pollination is most certainly by insects of which many different kinds were observed visiting the flowers. When ripe the seeds are ejected by the usual catapult mechanism and, as this plant does not coppice after fires, regeneration must take place from seed. The leaves give off a sweet smell reminiscent of eucalyptus when crushed.

DISCUSSION

This plant is placed in the genus *Euchaetis* Bartl. & Wendl. because it possesses the following characters: (1) *Flowers* 1–3nate. (2) *Petals* transversely bearded. (3) *Staminodes* vestigial. (4) *Anther* with a minute apical gland. (5) *Disc* well developed, exceeds the ovary. (6) *Stigma* capitellate. (7) *Style* short and glabrous. (8) *Filament* virtually glabrous. (9) *Ovary* 5-carpellate.

Euchaetis longicornis is recognised as distinct on account of its having subulate leaves, sharply pointed bracts and bracteoles, acuminate calyx lobes and a fruit with exceptionally long horns, a character to which the name refers.

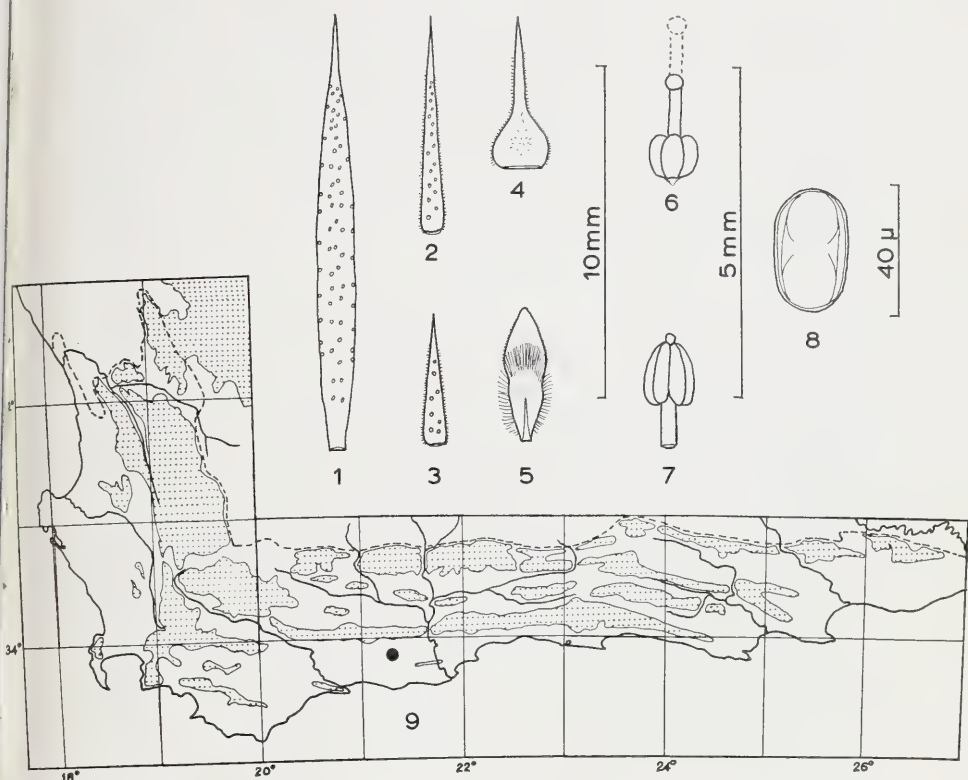


FIG. 2.

Euchaetis longicornis: 1. Leaf; 2. Bract; 3. Bracteole; 4. Calyx lobe; 5. Petal; 6. Gynoecium; 7. Anther; 8. Pollen; 9. Distribution.

***Diosma pilosa* Williams, sp. nov.** as basim monocaulis, propria propter ramulos graciles, folia adpressa, petala numero 2-7 pilos ferentia, discum vinosum, fructum cornibus perbreuibis.

Frutex 30-60 cm, diffusa, ad basim monocaulis. *Rami* erecti, glabri, graciles, dichotomi. *Ramuli* erecti, graciliores, minute scabridi, glanduloso-punctati, foliosi. *Folia* 6-7 mm longa, 1 mm lata, linearia, acuta, callosa, minute ciliolata vel eciliata, glabra, glanduloso-punctata, sessilia, adpressa, erecta, dispersa. *Inflorescentia* reducto-racemosa, terminalis. *Flos* 7 mm diam. *Bractea* 1.8-2.8 mm longa, 0.5-0.8 mm lata anguste lanceolata, acuta, rubro-callosa, minute ciliolata. *Bracteolae* duae, 1.3 mm longae, 0.4 mm latae, lanceolatae, rubro-

callosae, minute serrulatae. *Sepala* quinque, 2 mm longa, 1 mm lata, lanceolata, acuta, marginibus hyalinis sparsim ciliolatis, extus glabra multi-glanduloso-punctata, intus pubescentia. *Petala* quinque, 3,5 mm longa, 1,8 mm lata, ovata, ad basim decrescens, sub-sessilia, marginibus serrulatis sparsim ciliolatis, glanduloso-punctata, in medio numero 2-7 pilis ferens, alba. *Staminodia* fere carens. *Fila* quinque, glabra, vinosa, post anthesin 1,2 mm longa. *Antherae* quinque, ante anthesin 0,8 mm longae, 0,7 mm latae, globosae, vinosae, apicibus minute glandulosis. *Pollen* 48μ longum, 22μ diam., oblongum. *Discus* 5-sinuato-crenulatus, vinosus, apertus, nectarifer, ovarium excedens. *Stigma* 0,2 mm diam., capitellatum, globosum, vinosum. *Stylus* initio deflexus, deinceps erectus, 0,8 mm longus, glaber. *Ovarium* 5-carpellatum, 0,6 mm diam., glabrum, vinosum. *Fructus* 5-carpellatus, circa 6 mm longus, 5,5 mm diam., glaber, multi-glanduloso punctata, cornibus perbrevibus. *Semen* 4,5 mm longum, 2,2 mm latum, piceum, nitens.

Type: CAPE—3419 (Caledon): On a shoulder of the Riviersonderend mountains due south of Pilaarkop near Kōkriver (-BB), 460 m alt., 13/4/1974 Williams 1892 (NBG, holotype; BOL, C, K, MO, M, PRE, S, STE, isotypes).

The first collection of this plant appears to have been made by T. P. Stokoe in April 1930. He found it at an altitude of 1 000 m at Oudebos on the Riviersonderend Mountains. His specimen is preserved in Marloth's herbarium at Stellenbosch.

Shrubs 30-60 cm tall, diffuse, with many slender branches arising from a single stem near the base. *Branches* erect, glabrous, slender, fairly smooth, dichotomous. *Branchlets* erect, very slender, with the pubescence so short that the surface appears to be minutely scabrid, gland-dotted, yellow in colour, well covered by the leaves. *Leaves* 6-7 mm long, 1 mm broad, linear, acute, callused, apex bent slightly inwards, translucent margins at first ciliate becoming eciliate, glabrous, gland-dotted on both sides, sessile, adpressed, erect, scattered. *Inflorescence* terminal, reduced racemose. *Flowers* opening in succession, 6-7 mm diam., white with a red centre. *Bract* 1,8-2,8 mm long, 0,5-0,8 mm broad, narrowly lanceolate, acute, with a red callus, translucent margins narrow, minutely ciliate. *Bracteoles* two 1,3 mm long, 0,4 mm broad, lanceolate, acute, red callused, translucent margins minutely serrulate, glabrous except for a few indistinct hairs on the adaxial surface. *Calyx lobes* five, 2 mm long, 1 mm broad, lanceolate, acute, apex inflexed, translucent margins sparsely and minutely pubescent. *Petals* five, 3,5 mm long, 1,8 mm broad, ovate, subsessile, narrowed to the base, white, with gland dots and with from two to seven weak hairs 1,5 mm long near the midrib, margins serrulate with a few minute hairs. *Staminodes* five, virtually absent, a somewhat paler red dot on the disc. *Filaments* five, becoming 1,2 mm long, glabrous, wine coloured, inflexed at

first. *Anthers* five, before anthesis 0.8 mm long, 0.7 mm broad, globose, wine coloured, the apical gland becoming sticky at anthesis. *Pollen* $\pm 49\mu$ long, 22μ diam., oblong. *Disc* 5-sinuate, 5-crenulate at first, becoming less so after anthesis, wine coloured, exudes nectar, exceeds the ovary but stands open. *Stigma* 0.2 mm diam., capitellate, globose, dark red. *Style* at first deflexed, becoming 0.8 mm long, erect, glabrous. *Ovary* 5-capellate, 0.6 mm diam., carpels glabrous, globose, reddened at the apex. *Fruit* 5-carpellate, about 6 mm long, 5.5 mm diam., glabrous, with numerous small gland dots, horns very short with a recessed gland at the apex. *Seed* 4.5 mm long, 2.2 mm broad, black, shining.

SPECIMENS EXAMINED

CAPE—3419 (Caledon): Riviersonderend mountains in kloof (-BB), -/6/1949 *Davis s.n.* (SAM 64119); Riviersonderend mountains (-BB), -/6/1949 *Stokoe s.n.* (SAM 64125); Riviersonderend mountains near Zonder Einde (-BB), 14/6/1949 *Wilman 491a* (BOL); foothills of Riviersonderend mountains (-BB), -/4/5-1950 *Lewis 3367* (STE, SAM 64848), 30/4/1950 *Middelmost 1523* (NBG); foothills of Riviersonderend mountains near Neethling's farm (-BB), 30/4/1950 *Wilman 997* (BOL); Riviersonderend mountains, slopes near Riviersonderend (-BB), 2 000-2 500 ft., 5/2/1956 *Esterhuysen 25336* (BOL); Riviersonderend mountains, dry rocky hillside on the west side of the path from Esperance to Pilaarskop (-BB), 7/3/1971 *Esterhuysen 32576* (BOL), 9/4/1971 *Esterhuysen 32592* (BOL); on a shoulder of the Riviersonderend mountains, due south of Pilaarskop near Bokrivier (-BB), 460 m alt., 13/4/1974 *Williams 1892* (NBG, BOL, C, K, M, MO, PRE, S, STE); in dry stony ground, south facing, on the Riviersonderend mountains due south of Pilaarskop near Bokrivier (-BB), 1 600 ft., 13/4/1974 *Williams 1894* (NBG, K, M, MO, PRE, S, STE); Oudebos, Riviersonderend mountains (-BB), 1 000 m, -/4/1930 *Stokoe 2122a* (STE).

DISTRIBUTION AND BIOLOGY

Diosma pilosa would appear to be confined to the southern slopes of the Riviersonderend mountains in the vicinity of the village of Riviersonderend. It grows in well drained stony ground derived from the Table Mountain Sandstone at altitudes of from 460 m to 1 000 m above sea level. Having only been collected in bloom from February until June one cannot record the flowering season. Ripe fruits have also been seen in February, April and June, so that one can only say that it has a rather extended flowering period. The presence of nectar in the flowers is a factor which would indicate that this species is insect pollinated and the style at first deflexed, perhaps would indicate that this plant is not self pollinating. Ripe seeds are, as is normal, ejected by a catapult mechanism and regeneration takes place only from seed after fires. The leaves have a very faint smell when crushed.

DISCUSSION

The sub-sessile petals without a transverse beard, standing wide open, revealing the disc and reproductive parts, indicate that it must be placed in the genus *Diosma*.

Diosma pilosa is recognised as a distinct species because it is single-stemmed at the base, has slender branches, adpressed leaves, petals with 2-7 long weak hairs, disc wine coloured and fruits with very short horns. It is nearest in appearance to *Diosma meyeriana* Spreng. (= *D. virgata* B. & W. nom illegit.) but differs in having leaves with gland dots scattered on both sides of the midrib instead of one straight row of gland dots on either side of the midrib, flowers less numerous and much larger with petals bearing 2-7 long weak hairs, calyx lobes with much shorter cilia, and fruits with shorter horns spreading rather than erect. The name is an allusion to the long weak hairs on the petals.

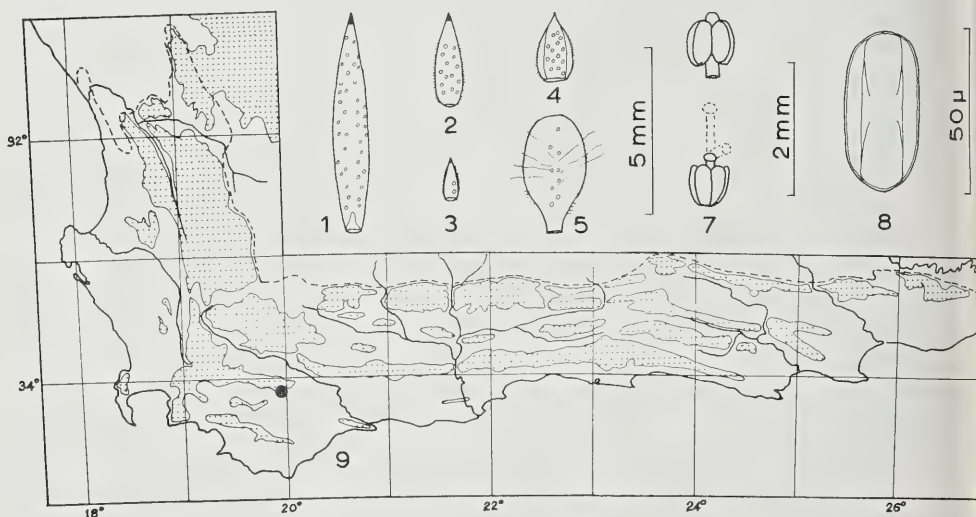


FIG. 3.

Diosma pilosa: 1. Leaf; 2. Bract; 3. Bracteole; 4. Calyx lobe; 5. Petal; 6. Anther; 7. Gynoecium; 8. Pollen; 9. Distribution.

Diosma rourkei Williams, sp.nov. ad basim 25 cm monocaulis, propria propter fruticem usque ad 2 m altum, ramulos fasciculatos, inflorescentiam aggregatam, stylos semper erectos.

Frutex 1–2 m, erectus, ad basim 25 cm monocaulis. *Rami* rigidi, erecti, glabri, asperi. *Ramuli* graciles, minute puberuli, erecti, fasciculati. *Folia* c. 9 mm longa, 1 mm lata, lineari-lanceolata, acuta, mucronata, petiolata, erecto-patens, dispersa, marginibus hyalinis angustis sparsim ciliolatis, costis rotundatis glabris lateribus glanduloso-punctatis, intus minute pubescentibus. *Inflorescentia* terminalis, ad 12 aggregata. *Bractea* 4–5, 5 mm longa, 0,4–0,6 mm lata, subulata, ciliolata, puberula. *Bracteolae* duae, 1,3 mm longae, 0,4 mm latae, lanceolatae, puberulae, ciliatae. *Sepala* quinque, 2–2,3 mm longa, 0,7–0,9 mm lata, oblonga, acuta, glabra, ad basim ciliata, intus pubescentia. *Petala* quinque, 2,8–2,9 mm longa, 1,4–1,6 mm lata, oblonga, glabra, sessiles, alba, recurva, sparsim ciliolata. *Staminodia* quinque, vestigialia. *Fila* quinque, aciculares, glabra, post anthesin 1,5 mm longa, patentes. *Antherae* quinque, ante anthesin 0,9 mm longae, 0,7 mm latae, flavidae. *Pollen* 46μ longum, 25μ latum, oblongum. *Discus* 5 sinuato-crenulatus, viridus, apertus, nectarifer, ovarium excedens. *Stigma* 0,35 mm diam., capitatum, globosum, viridum. *Stylus* 1,3 mm longus, erectus, glaber, persistens. *Ovarium* 5-carpellatum, 0,6 mm diam., glabrum, pallido-viridum. *Fructus* 5-carpellatus, 8 mm longus, 4,5 mm diam., glaber; *pedicellus* 3 mm longus; *cornua* 2,5 mm longa, erecta, pervirida. *Semen* 4,3 mm longum, 1,8 mm latum, piceum, nitens.

Type: CAPE—3324 (Steytlerville): Baviaanskloof, on the Pisgoedvlakte about 2 km from the farm Goedehoop on the road to Willowmore (-CB), 550 m alt., 18/6/1974 Rourke 1416 (NBG, holotype; Bol, C, GRA, K, M, MO, PRE, S, STE, isotypes).

Very little material relating to this species is to be found in herbaria because it occurs in an area through which the early travellers did not pass and so was not gathered by collectors, such as Drège or Schlechter, who made extensive distributions of their plants. The first recorded gathering was by Fourcade in 1934 who mis-identified it as *Diosma hirsuta* L. However the way in which the leafy branchlets are gathered together into little tufts makes it very easy to recognise as a distinct species even when dried. It was fortunate that Dr. J. P. Rourke, while recently on a collecting trip, was able to obtain an excellent sample of fresh material thus enabling the author to prepare this description.

Shrubs 1–2 m tall, erect, single stemmed for about the first 25 cm above ground. *Branches* stiffly erect, glabrous, becoming rough. *Branchlets* arising in clusters of which only two or three persist after two to four years, slender, erect, minutely puberulous. *Leaves* c. 9 mm long, 1 mm broad, linear-lanceolate, acute, mucronate, petiolate, spreading-erect, scattered, dark green, hyaline margins narrow, sparsely ciliate, abaxial surface glabrous with a rounded keel prominent when dried, gland dotted on both sides, abaxial surface minutely pubescent up the middle, somewhat convex when fresh becoming quite hollow when dry. *Inflorescence* terminal with the flowers up to 6 mm diam., aggregated into clusters of up to 12, opening in succession. *Pedicel* 1 mm long becoming

longer, glabrous. *Bract* 4–5.5 mm long, 0.4–0.6 mm broad at the base, subulate, ciliolate, puberulous on both sides. *Bracteoles* two, 1.3 mm long, 0.4 mm broad, lanceolate, acute, ciliate, puberulous on both sides. *Calyx lobes* five, 2–2.3 mm long, 0.7–0.9 mm broad at the base, oblong, acute, glabrous, ciliate below, pubescent on the inside, widely spaced. *Petals* five, 2.8–2.8 mm long, 1.4–1.4 mm broad, oblong, glabrous, sessile, recurved, white, apex pseudo-retuse with a small elevated point, margins somewhat irregular with a few short cilia. *Staminodes* five, vestigial, a small gland towards the apex of the lobe. *Filaments* five, glabrous, becoming 1.5 mm long, acicular, spreading after anthesis. *Anthers* five, before anthesis 0.9 mm long, 0.7 mm broad, oblong, yellow with a minute spherical apical gland. *Pollen* 46 μ long, 25 μ broad, oblong. *Disc* 5-sinuate-crenulate, with the lobes opposite the petals considerably elevated, pale green, stands wide open and free of the ovary, cup fills with nectar. *Stigma* 0.35 mm diam., capitate, globose, green, becoming sticky. *Style* erect, glabrous, becoming 1.3 mm long, persisting. *Ovary* 5-carpellate, 0.6 mm diam., glabrous, pale green, apices of the carpels with a gland surrounded by a few very small bristles. *Fruit* 5-carpellate, 8 mm long, 4.5 mm diam., *pedicel* 3 mm long; *carpels* glabrous, pale green or reddened if exposed, gland dotted on both sides; *horns* about 2.5 mm long, erect, dark green. *Seed* 3.7–4.3 mm long, 1.7–1.8 mm broad, black, shining.

SPECIMENS EXAMINED

CAPE—3324 (Steytlerville): Between Combrinck and Bokkraal, Humansdorp Division (-CB), 2 100 ft., -/10/1934 *Fourcade 5152* (BOL, STE); pass between Cambria and Combrinck, Baviaanskloof, Humansdorp Div. (-CB), 13/4/1952 *Lewis 4143* (SAM), 13/4/1952 *Compton 23475 & 23480* (NBG), 26/4/1953 *Compton 24076* (NBG), 21/10/1955 *Esterhuysen 24990a* (BOL); Baviaanskloof, on the Pisgoedvlakte about 2 km from the farm Goedeheop on road to Willowmore (-CB), 1 800 ft., 18/6/1974 *Rourke 1416* (NBG, BOL, C, GRA, K, M, MO, PRÉ, S, STE); top of escarpment Baviaanskloof (-CA), 3 000', 17/4/1973 *Bayliss 6058b* (NBG).

—3323 (Willowmore): Kouga Mt., peak east of Smutsberg, Uniondale Div. (-DB), 27/11/1941 *Esterhuysen 7039* (BOL, NBG); Kouga Mt., lower slopes east of Smutsberg (-DB), 12/11/1944 *Esterhuysen 10723* (BOL); Kouga Mts., between Studtis and Smutsberg, summit slope, Willowmore Div. (-DB), 20/9/1953 *Taylor 902* (NBG).

DISTRIBUTION AND BIOLOGY

From the few collections made it would appear that this plant has a rather small area of distribution. It has been found growing at altitudes of from 550 to 1 500 m (1 800 to about 5 000 feet) above sea level on the Baviaanskloof and Kouga mountains. It appears to be a vigorous plant growing in dense stands to a

height of 2 m on soil derived from Table Mountain Sandstone. The flowers, which stand wide open, secrete nectar and are visited by numerous bees and flies amongst which was found a very large bee-like fly with striped eyes. While the pollen is being shed the ovary is minute and the stigma, which at this stage is not sticky of its own accord, is adpressed at the apex of the ovary a long way below the ripe anthers. Some time later, when the pollen has been shed, the style lengthens and the stigma becomes sticky and therefore probably receptive. The flowers would thus appear to be insect pollinated. Flowering and fruiting material have been gathered from April until November so it is possible that this plant could remain in bloom practically the whole year round. The percentage of flowers that actually mature into fruits is very low. One reason for this may be that the centres of many of the flowers are found nibbled out by insects. This is made easier by the wide open petals and is a condition often seen in other species in the genus *Diosma*. Seeds, when ripe, are ejected by the usual catapult mechanism. The plant is single stemmed at base and does not coppice after fires so that regeneration must be entirely by seed. A section from the

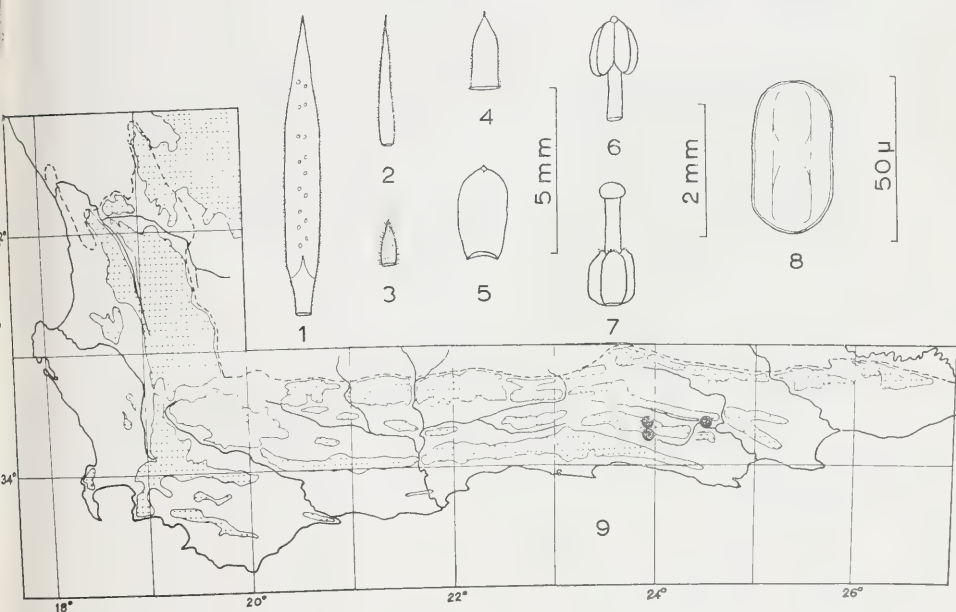


FIG. 4.

Diosma rourkei: 1. Leaf; 2. Bract; 3. Bracteole; 4. Calyx lobe; 5. Petal; 6. Anther; 7. Gynoecium; 8. Pollen; 9. Distribution.

lower part of the stem, about 25 mm diam., shewed about seventeen rings. According to Rourke this particular stand had clearly not been burnt for perhaps twenty years. The leaves have a faint smell of pine needles when crushed.

DISCUSSION

This plant appears, in nearly all respects, to be a typical *Diosma*. (1) The flowers are aggregated by reduction into terminal heads. (2) The petals are nude and sessile. (3) The staminodes are vestigial. (4) The anther possesses a minute apical gland. (5) The disc is sinuate-crenulate, stands wide open and exceeds the ovary. (6) The stigma is capitate. (7) The style is short. (8) The filament and style are glabrous. (9) The ovary is 5-carpellate. *D. rourkei* is a distinct species because it is an erect shrub up to 2 m tall, single stemmed for 25 cm at the base, with branchlets crowded into small tufts, the flowers aggregate and the style always erect.

***Diosma aristata* Williams, sp. nov.** ad basim monocaulis, propria propter fruticem praeter apices cornuum glabrum, folia grandiora dispersa patula aristata.

Frutex 70 cm, erectus, ad basim monocaulis. *Rami* dispersi, erecti, glabri, foliis persistens. *Folia* ad 19 mm longa, 2,4 mm lata, subulata, aristata, glabra, glanduloso-punctata, dispersa, patula. *Inflorescentia* reducto-racemosa, terminalis. *Flos* 6 mm diam., pedicellatus. *Bractea* extima 6 mm longa, 1,1 mm lata, similis folio; intima 1 mm longa, 0,6 mm lata, vestigialis. *Bracteolae* duae ad basim calycis, 0,7 mm longae, 0,5 mm latae, lanceolatae, acutae, glabrae, fere vestigiales. *Sepala* quinque, 1,5–1,8 mm longa, 1,2 mm lata, oblonga, apiculata, glabra, plana, marginibus hyalinis serrulatis. *Petala* quinque, 3 mm longa, 1,5 mm lata, oblonga, obtusa, sessiles, alba, patentes. *Staminodia* quinque, 0,1 mm diam., vestigilia. *Fila* quinque, glabra, post anthesin 1,6 mm longa, patentes. *Antherae* quinque, ante anthesin 1,3 mm longae, 0,8 mm latae, oblongae, flavidae. *Pollen* 51 μ longum, 24 μ diam., oblongum. *Discus* 5-sinuato-crenulatus, viridus, apertus, nectarifer, ovarium excedens. *Stigma* 0,25 mm diam., capitellatum, globosum, viridum. *Stylus* initio deflexus, deinceps erectus 1,2 mm longus, glaber. *Ovarium* 5-carpellatum, 0,7 mm longum, 0,8 mm diam., viridum, ad apice minute pilosum. *Fructus* 5-carpellatus, 12 mm longus, pedicellatus, grandulifer. *Cornua* 5 mm longa, patentia, ad apices minute pubescentia. *Semen* 5,5 mm longum, 2,5 mm latum, piceum, nitens.

Type: CAPE—3422 (Mossel Bay): On the north slopes of the hill about 2,5 km east of Mossel Bay near the Reservoir (-AA), 170 m alt., 6/5/1974 Williams 1902 (NBG, holotype; BOL, C, GRA, K, MO, M, PRE, S, STE, isotypes).

The first person to collect this little known species was William Burchell who gathered his specimen "Near landing place Mossel Bay" on the 28th Octo-

ber 1814. He placed the manuscript name "*Diosma pungens*" on his ticket together with the number 6304 and a brief description which was never published. His herbarium was presented to Kew, too late for it to have been seen by Sonder who had already finished working on the *Diosmeae* for the *Flora Capensis*, published in 1860. From the appearance of the dried material this appeared to be such an unusual plant that it was with great satisfaction that the author was able recently to rediscover it in the vicinity of Mossel Bay.

Shrubs 70 cm tall, erect, well branched, fairly dense, arising from a single stem at ground level. *Branches* scattered, erect, glabrous, ashy coloured, remaining leafy for a long time, not hidden by the leaves. *Leaves* up to 19 mm long, 2,4 mm broad, subulate, acute, with a very sharp point at the apex, margins narrowly translucent with a sharp smooth edge, narrowed slightly at the base to a petiole about 0,5 mm long, glabrous, dark green, triangular in cross-section, gland dotted on both sides of the midrib, scattered, spreading-erect. *Inflorescence* terminal, with up to 5 flowers in a reduced compound raceme; *flowers* about 6 mm diam., pedicellate, the white petals widely spaced with the greenish calyx lobes and disc clearly showing, opening in succession over a long period of time. *Bract* pertaining to the outermost flower 6 mm long, 1,1 mm broad, leaf like; the innermost or upper becoming vestigial, about 1 mm long, 0,6 mm broad, deltoid, glabrous. *Bracteoles* two, placed above the pedicel at the base of the calyx, 0,7 mm long, 0,5 mm broad, lanceolate, acute, glabrous, margins translucent, very minutely serrulate, virtually vestigial. *Calyx lobes* five, 1,5–1,8 mm long, 1,2 mm broad, oblong, apiculate, glabrous, flat, with about 4 gland dots, margins translucent, minutely serrulate. *Petals* five, 3 mm long, 1,5 mm broad oblong, obtuse, sessile, white, spreading widely. *Staminodes* five, vestigial, a minute gland about 0,1 mm diam. towards the apex of the lobe of the disc. *Filaments* five, becoming 1,6 mm long and spreading widely after anthesis, glabrous. *Anthers* five, before anthesis 1,3 mm long, 0,8 mm broad, oblong, yellowish, with a globose sessile apical gland. *Pollen* 51μ long, 24μ diam., oblong. *Disc* 5-sinuate, 5-crenulate, green, exceeds the ovary, stands open forming a cup which fills with nectar. *Stigma* 0,25 mm diam., capitellate, globose, green. *Style* deflexed at first, becoming 1,2 mm long, erect, glabrous. *Ovary* 5-carpellate, 0,7 mm long, 0,8 mm diam., with the carpels minutely bristly around the edges above. *Fruit* 5-carpellate, pedicellate; *carpels* 12 mm long, including the horn 5 mm long, glabrous, well endowed with oil glands which readily give off a rather sweet pleasant smell; *horns* spread widely, with apices minutely pubescent. *Seed* 5,5 mm long, 2,5 mm broad, black, shining.

SPECIMENS EXAMINED

CAPE—3422 (Mossel Bay): Near landing place Mossel Bay (-AA), 28/10/1814 Burchell 6304 (K); Mossel Bay (-AA), -/2/1914 Moran s.n. (BOL,

SAM 9069), 7/2/1941 *Walgate* 208 (NBG); On the north slopes of the hill about 2,5 km east of Mossel Bay, near the reservoir (-AA), 170 m alt., 6/5/1974 *Williams* 1902 (NBG, K, M, MO, PRE, S, STE).

DISTRIBUTION AND BIOLOGY

Diosma aristata would appear to be a fairly rare plant confined to a small area lying to the west of Mossel Bay where its continued existence is now very much in doubt as the whole area is thickly infested with the Australian *Acacia cyclops* introduced to control local drift sand many years ago. It grows in deep sandy soil or, according to Burchell, amongst rocks and would seem to have a very extended flowering period. The nectariferous disc would indicate pollination by insects. Ripe seeds are ejected by the usual catapult mechanism and regeneration most probably takes place after fires. It does not coppice from the root. The leaves give off a pleasant smell rather like that of *Diosma hirsuta* when crushed. A stem 1 cm in diam., showed about 6 annual rings.

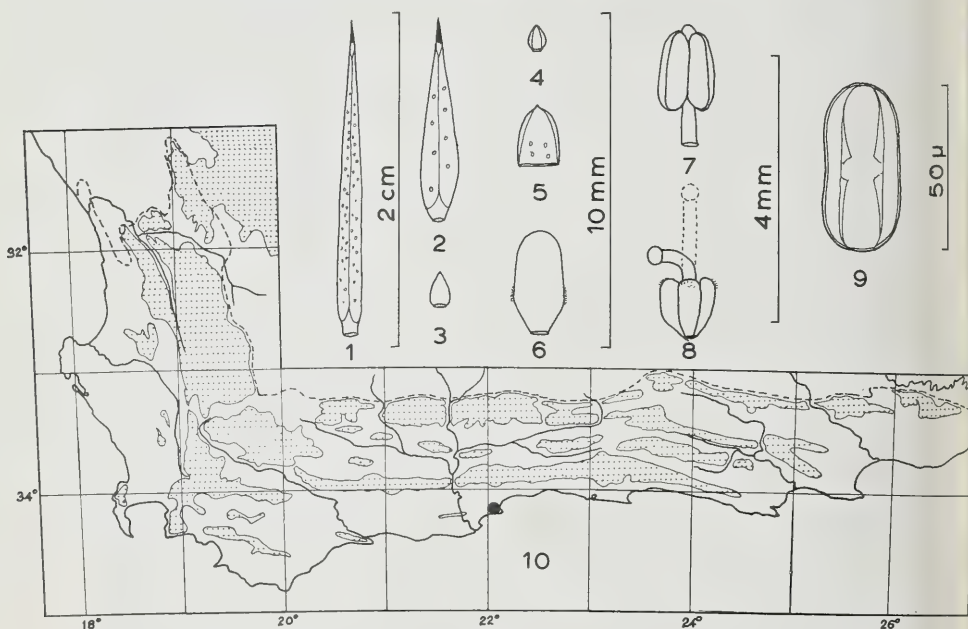


FIG. 5.

Diosma aristata: 1. Leaf; 2. Bract (outermost); 3. Bract (innermost); 4. Bracteole; 5. Calyx lobe; 6. Petal; 7. Anther; 8. Gynoecium; 9. Pollen; 10. Distribution.

DISCUSSION

The following characters show this plant to be a typical *Diosma* (1) *Flowers* solitary in reduced compound racemes. (2) *Petals* nude, sessile. (3) *Staminodes* vestigial. (4) *Anthers* with a minute apical gland. (5) *Disc* sinuate-crenulate, stands open, exceeds ovary. (6) *Stigma* capitellate. (7) *Style* short, at first deflexed. (8) *Filaments* and *style* glabrous. (9) *Ovary* 5-carpellate.

Diosma aristata is recognised as distinct on account of being a plant, arising from a single stem at the ground, with very large aristate scattered leaves, completely glabrous except for the apices of the horns on the fruits. The name alludes to the very sharply pointed leaves.

Macrostylis cauliflora Williams, sp.nov. propria propter fruticem cauliflorum, folia glanduloso-punctata non nisi in costis marginibusque, in omnes partes praeter stigmata parvula.

Frutex 30 cm altus, 50 cm patens, compactus ad basim ramificans mono-caulis. *Rami* brevi, numerosi, dichotomi, glabri, asperi. *Ramuli* graciles, numerosi, erectiusculi, foliosi, sparsim puberuli. *Folia* 2–2,5 mm longa, 1,3–1,5 mm lata, elliptica, obtusa, ecallosa, fere eciliata, costis marginibusque glanduloso-punctatis, crassa, glabra, glauca, sessilia, erecta, sparsa. *Inflorescentia* terminalis, pseudo-cauliflora, sessilia, usque ad sex flores aggregata. *Bractea* saepe delapsa, 1,5 mm longa, 1 mm lata, sub-orbicularis, sparsim ciliolata, crassa, glabra, adpressa, costis glanduloso-punctatis. *Bracteolae* duae, 1–1,3 mm longae, 1 mm latae, orbiculares, glabrae, intus concavae, marginibus hyalinis latis membranaceis ciliolatis. *Sepala* quinque, 1,5 mm longa, 1,5 mm lata, orbicularia, glabra, marginibus hyalinis latis membranaceis ciliolatis. *Petala* quinque, 2,8 mm longa, 1 mm lata, obtusa, in medio villosa. *Staminodia* quinque, 0,15 mm longa, globosa, vestigialia. *Fila* quinque, 3,5 mm longa, filiformia, glabra. *Antherae* quinque, ante anthesin 0,6 mm longae, flavae, glandula 0,2 mm diam. coronata. *Pollen* 45 μ longum, 21 μ diam., oblongum. *Discus* 5-lobatus, viridus, styli basin cingens, nectarifer. *Stigma* 0,3 mm diam., capitellatum, depressum, globosum. *Stylus* 3,6 mm longus, erectus, glaber, crassus. *Ovarium* 3-carpellatum, 0,6 mm longum, 0,7 mm diam., glabrum. *Fructus* 3-carpellatus, cujus unus, duo vel tres maturescunt, ad 11,5 mm longus, *Cornua* 4 mm longa, obtusa. *Semen* 5 mm longum, 2 mm latum, piceum, impositum.

Type: CAPE—3419 (Caledon): Near the Koude-rivier between Gansbaai and Napier in the Bredasdorp Division (-DA) 76 m alt., 27/2/1974 Williams 1876 (NBG, holotype; BOL, K, MO, M, PRE, STE, isotypes).

Collected by Harry Bolus in 1895 and by Schlechter in 1896 this plant remained unnoticed until this year when a fresh gathering made by Oliver in 1973 was sent to me for identification. It was apparent to me that it differed from all other known species of *Macrostylis* and its position as a geographical outlier

far from any other members of its genus made it even more interesting. Collections, from which this description was prepared, were therefore made in February 1974 and again, in order to obtain fruiting material, in June.

Shrubs up to 25 years old, 30 cm tall, spreading 50 cm, dense, arising from a fairly stout root, branching at ground level. *Branches* short, numerous, dichotomous, glabrous with a rough bark. *Branchlets* very numerous, slender, fairly erect, not very straight, well clothed with leaves, reddish coloured, sparsely puberulous. *Leaves* 2–2,5 mm long, 1,3–1,5 mm broad, elliptic, obtuse without any apical callus or hyaline margins, almost eciliate, glabrous, thick, fleshy, sub-glaucous, gland-dotted on the broad midrib and sometimes minutely so on the margins, sessile, erect, scattered. *Inflorescence* appears to be borne on the older wood at the base of the leafy branchlets, normally at the forking of two branchlets, up to 6-flowered, with flowers 7 mm diam., white, sessile. *Bract* frequently delapsing in the early stages of flowering, 1,5 mm long, 1 mm broad, sub-orbicular, hyaline margin narrow, sparsely ciliolate, thick, glabrous, adpressed, midrib gland-dotted. *Bracteoles* two, 1–1,3 mm long, 1 mm broad, orbicular, obtuse, glabrous, ciliolate, hyaline margins broad and membranous, concave. *Calyx lobes* five, 1,5 mm long, 1,5 mm broad, orbicular, obtuse, glabrous, with a thick green midrib and broad membranous ciliolate margins. *Petals* five, 2,8 mm overall; *limb* about 1 mm diam., obtuse, glabrous, 5–6 gland-dots on the under side; *claw* 1,7 mm long, 0,7 mm broad, narrowing to the base, villous mostly down the midrib, eciliate. *Staminodes* five, 0,15 mm long, globose, vestigial. *Filaments* five, 3,5 mm long, filiform, glabrous. *Anthers* five, before anthesis 0,6 mm long, yellow with a spherical apical gland 0,2 mm diam. *Pollen* 45 μ long, 21 μ diam., oblong. *Disc* 5-lobed, more or less closes over the ovary, dark green, exudes nectar. *Stigma* 0,3 mm diam., capitellate, depressed globose. *Style* becoming 3,6 mm long, erect, stout, glabrous. *Ovary* 3-carpellate, 0,6 mm long, 0,7 mm diam.; *carpels* broad, retuse, red tipped. *Fruit* 3-carpellate of which one, two or three ripen, glabrous, gland-dotted, reddened, up to 11,5 mm long including the *horn* 4 mm long, obtuse at the apex. *Seed* 5 mm long, 2 mm broad, black, not shining.

SPECIMENS EXAMINED

CAPE—3419 (Caledon): In collibus prope Bredasdorp, Elim (-DB), -/7/1895 *H. Bolus* 8477 (BOL, K), 15/7/1895 *Guthrie* 3824 (NBG); Elim (-DB), 500 ft., 22/4/1896 *Schlechter* 7684 (BM, BOL, K, W,); Koude River east of Baardscheersbosch, dry rocky slope above river (-DA), 200 ft., 27/3/1973 *Oliver* 4221 (STE); Near the Kouderivier between Gansbaai and Napier in the Bredasdorp Division (-DA), 76 m alt., 27/2/1974 *Williams* 1876 (NBG, K, M, MO, PRE, S₂ STE).

—3420 (Bredasdorp): Bredasdorp mountain. Lower stony, north slopes (-CA), 29/9/1965 *Esterhuysen* 31231 (BOL).

DISTRIBUTION AND BIOLOGY

Macrostylis cauliflora appears to be confined to a few very small areas of remnant arid scrub in the Bredasdorp Division. At Kouderivier it was observed growing on portions of a dry rocky south facing slope that had escaped the attentions of a bulldozer that had demolished most of the local indigenous vegetation in its search for gravel for the new road. Nearby wherever the ground is level it has been ploughed up for growing crops. It is easy to see that the chances of survival of this relic are rather slim at present. Having been collected in bloom from February until July, it would seem to have an extended flowering period. Ripening fruits were gathered in June (Williams 1903) when it was found that this area had recently been heavily grazed off and trampled by sheep. The whole colony was being rapidly exterminated. It is quite possible that, when the number of individuals falls below a certain point, an irreversible process will take place in which recovery will become impossible and this species will become extinct. The ripe seeds are ejected in the normal way by a catapult mechanism. As far as can be seen regeneration takes place only from seed. The leaves, when crushed, are almost without any smell.

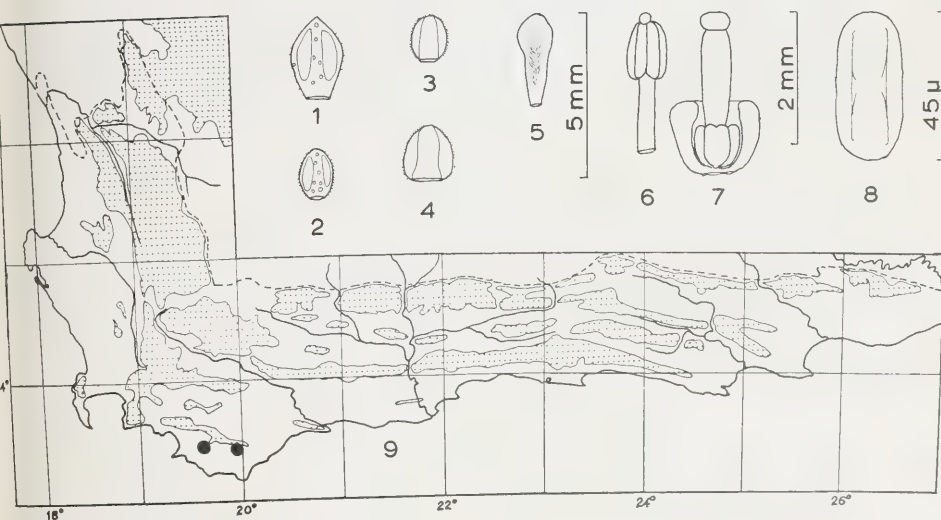


FIG. 6.

Macrostylis cauliflora: 1. Leaf; 2. Bract; 3. Bracteole; 4. Calyx lobe; 5. Petal; 6. Anther; 7. Gynoecium; 8. Pollen; 9. Distribution.

DISCUSSION

This species has been placed in the genus *Macrostylis* Bartl. & Wendl. because each one of the following characters, which it possesses, helps to exclude it from some other genus in the *Diosmeae*. (1) *Heads* multiflorous, up to 6. (2) *Petals* villous, mostly down the midrib. (3) *Staminodes* vestigial. (4) *Anthers* with a minute apical gland. (5) *Disc* encloses the ovary. (6) *Stigma* capitellate, larger than usual in the genus. (7) *Style & filament* long, exceeding the petals. (8) *Style & filament* glabrous. (9) *Ovary* 3-carpellate. (10) *Fruit* with fairly short horns, 2 mm long, which is unusual in the genus.

Macrostylis cauliflora is recognised as distinct on account of being a pseudo-cauliflorous shrub with leaves gland-dotted only on the midrib and margins, with leaves, petals, style and filaments all smaller than usual and with the stigma rather larger than usual. It is, in appearance, most like *Macrostylis crassifolia* Sond. but differs in that the leaves of *Macrostylis crassifolia* are gland-dotted all over, not only on the midrib and margins. The name is an allusion to the habit of this plant of bearing the flowers below the leafy branchlets.